Stakeholder Needs and Expectations

Planning Your Agile Project and Program Metrics

William A. Broadus III

A key element in the success of any project or program is the ability to communicate progress against a baseline of cost, schedule and technical performance within and outside the team. When the expectations for communications are not understood clearly and/or are misaligned horizontally or vertically across the program, it becomes very difficult for all affected stakeholders to answer the questions, "So where are we today? Where will we be tomorrow?"

The communication of metrics can facilitate trust, illustrate progress, identify issues and highlight the effectiveness of implemented process improvements. To achieve these benefits, measuring and reporting should be at the heart of every project including those based upon Agile approaches. However, projects or programs with Agile content often require their own set of tailored metrics and traditional assessments that may not be usable for the entire stakeholder set. This particular point is an important planning consideration in the Department of Defense (DoD) environment where there is significant hierarchical reporting and numerous levels of multiple stakeholders, all with varying needs and expectations for performance data and information.

By their very nature, Agile metrics are available to be reported and analyzed more frequently since this approach delivers projects through small, well-vetted "sprints." Each sprint has a goal, and the assessment of achieved

Broadus *is a professor of Program and Engineering Management at the Defense Acquisition University.*

Report Documentation Page

1. REPORT DATE **DEC 2013**	2. REPORT TYPE	3. DATES COVERED **00-00-2013 to 00-00-2013**

4. TITLE AND SUBTITLE **Stakeholder Needs and Expectations. Planning Your Agile Project and Program Metrics**	5a. CONTRACT NUMBER
	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Defense Acquisition University,Defense AT&L,9820 Belvoir Road,Fort Belvoir,VA,22060-5565**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**5**	

functionality always is a conducted activity of the sprint with the user representative.

Given the increased frequency and quantity of available metrics, Agile teams need to highlight only the most vital and timely metrics. What "vital and timely" means to various stakeholders is where the real crux of planning resides: Determine the needs and expectations of performance reporting at all stakeholder levels. There is a requirement to align reporting across all levels of the government-vendor team. This requires matching the traditional DoD project monitoring methodology (focusing on tracking the performance of each work breakdown structure [WBS] work-package) to that of Agile methodology (where tracking is focused on incremental delivery of functional capability). Within DoD acquisition, we have to structure our solicitations to accommodate these different requirements during the project/program execution.

In planning performance reporting, each stakeholder group should receive only the metrics relevant to its needs and expectations. Emerging best practices within the software development community have identified a potential set of criteria for establishing metric requirements for various stakeholder groups working on Agile programs:

• Relevance to their decision-making affecting the project/program
• Sufficiency of detail to be usable
• Availability (e.g., daily, for an iteration or release, or a milestone/gateway … etc.) for their roles and responsibilities

To be effective, a proposed model for tailoring Agile metrics would be based around commonly definable stakeholder groups. Within DoD, a potential set of groups could include direct team members, senior sponsors/leaders, organizational stakeholders and external stakeholders/users. Understanding the composition of these groups, and establishing a set of specific expectations each would have for performance metrics would promote development of specific information

requirements that can be articulated within the body of a contractual vehicle.

Stakeholder Needs—Team Members

More than any other audience, team members need highly specific and detailed information because they have the greatest immediate use for such data.

This particular group is involved in the daily efforts associated with the planning, development, testing and delivery of software to support functional capability requirements. Therefore, this group needs highly specific and detailed information that is immediately available for use. These data must quickly describe what is happening with the project (at the sprint level), provide a means to diagnose issues, identify areas for improvement and provide positive incentives for the team. The intent is to select only the best metrics that give teams the detail they need without overwhelming them.

Research on the evolving best practices within the Agile development community indicates that a set of performance information focused on the team member stakeholders likely would consist of the following commonly available metrics:

- **Velocity**: The number of features a team can deliver during a sprint is the principal Agile metric, as it allows the team to accurately predict and plan progress, thereby keeping projects on schedule and within budget.
- **Burn Up/Burn Down (BU/BD)**: A burn-up chart shows how many features the team has promised to deliver, while a burn-down chart shows how many features it has completed. The real power of these charts to the team members is motivation. They permit team members to clearly see when they are likely to finish the project and, in comparison, to see the steady reduction of the work still to be

done. This particular metric enhances the team's ability to answer earned value management (EVM) questions about "what value has been earned and what is left to complete."

- **Running Tested Features (RTF)/Defect Density**: For all software development projects/programs, understanding defects has been a standard metric and is a completely applicable and critical quality metric in the Agile environment. RTF, a similar measurement, shows how many features in each sprint have passed acceptance tests. As with the BU/BD metric, positive data can be very motivating to the development team. In practice, Agile techniques such as "test-driven development" and "acceptance test-driven development" contribute significantly to the prevention of defects. Not introducing defects into the system in the first place will greatly reduce "defect density" when compared with the more traditional DoD software development approaches.

Stakeholder Needs—Senior Sponsors and Leadership

For senior-level leadership of both Agile and non-Agile projects, traditional metrics are still the most appealing. For these stakeholders, the strategic concerns of the project or program are chief concerns. For this group, the primary focus is understanding whether the project is on budget and schedule and going to deliver the promised performance. As a general rule, the details of issues such as defects, unless they affect the cost, schedule or capability of the software, are not important.

At this touchpoint in the DoD hierarchy of senior leaders and project team members, the real difficulty in translating metrics occurs. Agile metrics differ from traditional metrics in that they are considered "adaptive" rather than "predictive." In a traditional waterfall project, the cost, time and desired capability are defined at initiation; therefore, the metrics emphasize planned values (the Budget Cost of Work Scheduled [BCWS]

Figure 1. Sample Burn Down Chart
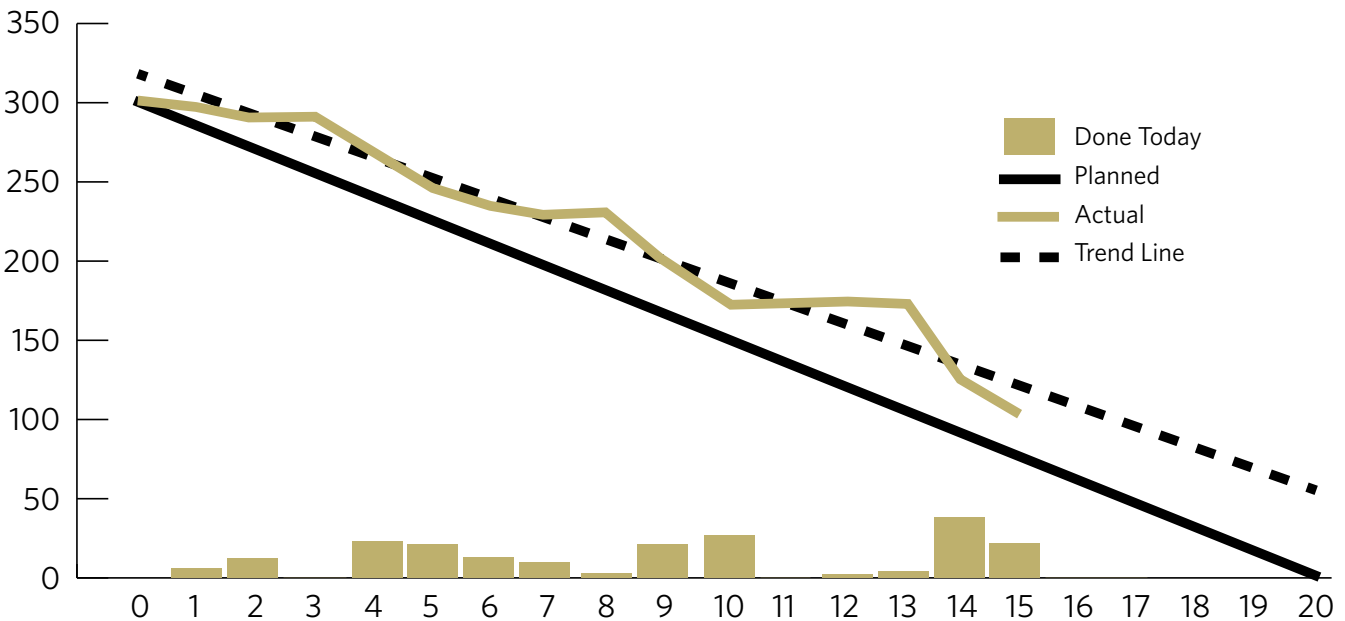
from an EVM perspective). In an Agile development project, these constraints (BCWS) will evolve as a function of the quality of the software completed; the emphasis shifts to metrics focused on earning value (Budgeted Cost of Work Performed or BCWP).

In a fashion similar to the discussion of team members, research on the evolving best practices within the Agile development community indicates that a set of performance information, focused on the senior sponsors and leadership stakeholders likely would be built around the following metrics:

- **Burn Down (BD)**: The senior sponsor and leader version of a burn-down report would summarize from a high level how many required performance capabilities or features have been delivered and how many remain outstanding. To facilitate this reporting, there needs to be a clear, traceable and unambiguous systems engineering discipline of "threading" the user-based requirements (Key Performance Parameters and Key System Attributes) and the buyer-based requirements (Specifications, Statement of Objectives and/or Statement of Work-related) down to the capabilities being provided with each Agile sprint.
- **Earned Business Value (EBV)**: EBV is a commercial sector practice that communicates an Agile project's progress toward delivering its expected goals. It may be adaptable to the DoD environment since it is related to similar principles that allow for the use of an EVM system. In practice, when items from the product backlog (the remaining agreed-to project performance capability yet realized) are completed, they add to the project's EBV as a percentage of its cumulative Return on Investment (ROI). This percentage is determined for each specific capability delivered during a particular sprint. Since quality of the developed software is an Agile project's principal objective, EBV as a metric provides senior sponsors and leadership a measure of how much value has been delivered thus far for the end user. As with the "Burn-Down" above, strong linkage between the individual "scope" of each sprint and the high-level performance of the system at the "user perspective" is critical to the value of the EBV metric.

A metric such as EBV may prove too complicated to articulate in data deliverable in your solicitation or to utilize within the DoD program environment, so an internal manipulation of performance data may be required to meet the expectations of senior sponsors and leadership.

The current DoD practice utilizes a "dashboard" that fundamentally can display what the team has

committed to, what it has accomplished so far and what it has yet to deliver.

Potentially, there are other persons affiliated with the senior sponsor and leadership groups who have an interest in a project but aren't working directly on it. This group would include roles such as the program manager(s),Fleet liaison, resources and other functional managers. They generally will be interested in the same high-level business metrics as the senior sponsors and leadership, though they often require additional details related to their specific functions.

For example, the Fleet liaison team lead may need to know when a software increment or full capability will be available so the team can plan and resource the Fleet implementation with support engineers and the receiving activity. The metric of "Velocity" would not be a useful metric on its own for the liaison team but would become very relevant when accompanied by a direct detailed narrative discussion on the team's progress.

Facilitating the exchange of information such as this will be a key role of the "Agile Advocate" and "end-user representative." These two roles, as discussed in the January-February 2013 *Defense AT&L* magazine article "The Challenges of Being Agile in DoD," form the key bonds between the development team and outside world of the program office and other stakeholders.

Stakeholder Needs—External Stakeholders

The external stakeholders are the group that receives the greatest benefit from Agile approaches due to its improved "time to market." In DoD, this group of stakeholders includes both the end-user in the Fleet, as well as elements within the parent service and/or at the level of the Office of the Secretary

Figure 2. Earned Business Value Example
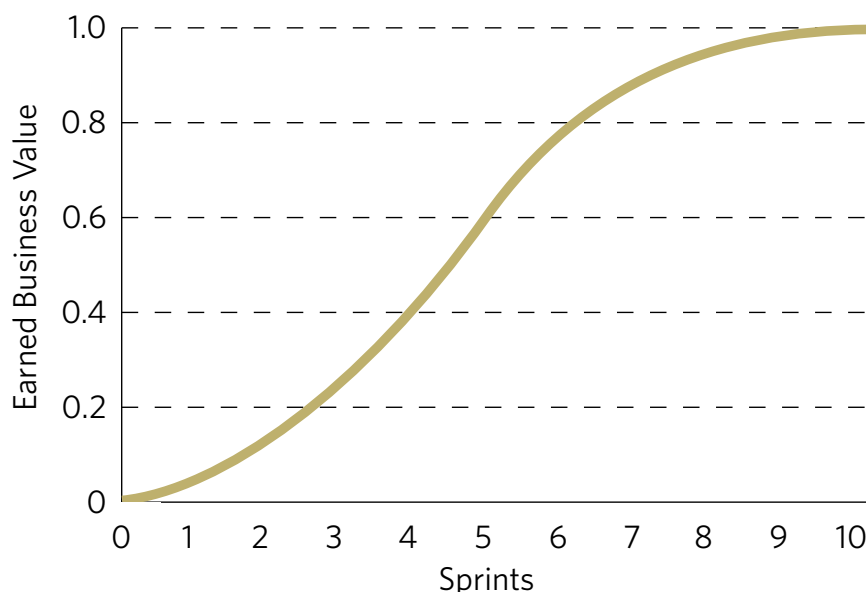
> **Agile metrics differ from traditional metrics in that they are considered "adaptive" rather than "predictive."**

of Defense. If these stakeholders are funding the project, they should receive the same high-level business metrics, such as EBV, that senior sponsors and leadership get. Otherwise, as in the case of the Fleet user, the metric they will care about most will be whatever portion they get and when their "vetted capabilities need" will be delivered.

The most compelling aspect of Agile is its iterative process. Software capabilities can start showing up earlier to the Fleet user than in the traditional process. Close coordination and sound configuration management discipline are necessary to ensure that all the needed elements are in place for the user to accept these incremental capability enhancements—a clear driver for the proper set of metrics.

Take Time and Be Selective

A large array of Agile metrics is available to project managers and the stakeholders they team with. Because of the nature of Agile (i.e., an emphasis on speed), it demands that project managers choose their information tools wisely to effectively integrate with the demands of the team, sponsors, leadership and external customers.

Aligned to Agile principles, the project team should look to measure the minimum necessary to satisfy all the stakeholder requirements. DoD therefore must stipulate what performance reporting it desires at all levels and allow the development team to propose ways to meet that reporting requirement. In essence, DoD needs to consider how to focus on providing a "statement of objective for metrics" to facilitate better performance reporting.

Other Best Practices

The suggested metrics proposed in this article offer a potential foundation for discussing what information to present to stakeholders at various levels. If, however, the stakeholders on your particular program are not satisfied with your planned approach to reporting performance, best practices suggest the following strategies be considered to obtain buy-in:

• **Solicit Examples**. If your stakeholders desire more or different metrics, ask them to provide a template or report format consistent with their needs. This practice is better served prior to the award of a contract for development, when potential vendors can adjust their scope and cost estimates.

• **Promote Open Communication**. Agile is fast-paced, so offer greater visibility of the information being collected. This can satisfy those who wish to analyze the development from an independent perspective. This practice, however, can create a huge additional burden on those directly involved in the development process: having to explain terminology and the purpose of details well beyond the needs of those external to the team. Again, this is an excellent opportunity for the "Agile Advocate" to mediate between the various stakeholder elements.

• **Encourage Collaboration**. A key stakeholder seeking greater levels of information actually may be looking for greater levels of involvement. An approach espoused in the commercial sector is to make this key stakeholder a "co-owner" of the team's product backlog (the remaining agreed-to performance capability of the project that is yet to be realized) along with the product owner. This action would ensure the stakeholder's involvement in the "construction and grooming" of the product backlog continuously from initiation to closeout of the project.

Conclusions and Summary

Agile, while different in approach than traditional software-intensive projects and programs, still has as a central element the need for high-quality communication of cost, schedule and technical performance. The development team seeks to instill a sense of trust, illustrate its progress and facilitate the resolution of issues that affect all stakeholders, team members, senior sponsors and leadership as well as those outside the organization.

To achieve these goals, the need for metrics that are effective measures across all stakeholder levels must be accommodated in the program's acquisition strategy. Determining what vital and timely mean at all levels is an early planning requirement if stakeholder expectations of performance reporting are to be met. This task requires cross-matching the traditional DoD WBS-based project monitoring methodology to that of an Agile incremental functional capability monitoring methodology. The desired outputs must focus on supporting decision making by delivering sufficient and relevant details in a timely fashion to leadership at all levels of the organization—a desired accomplishment in any program, let alone an Agile one.

Accomplishing the above is not always a simple and straightforward process. Obtaining the proper level of buy-in on what the various stakeholders believe is a robust set of performance metrics for an Agile-intensive project or program may necessitate the use of additional best practices. Strategies should look to include open solicitations of example templates or formats (better served prior to contract award), upfront promotion of open communications that include relying upon your "Agile Advocate" and establishing an environment of collaboration through co-ownership of key program planning throughout the development life cycle.

---

*The author can be contacted at **william.broadus@dau.mil**.*